

NEW SPECIES OF INTERTIDAL MESOSTIGMATA (ACARI) FROM NEW ZEALAND

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Abstract. *Dendrolaelaps (Pontiolaelaps) crenatus*, *D. (P.) terebratus* subgen. nov., spp. nov., and *Leioseius australis* sp. nov., are described. All species occur on barnacle-encrusted rocks on the north-east coast of the North Island, New Zealand.

The free-living Mesostigmata of the rocky shore are all carnivorous, probably feeding on other mites, springtails and small crustaceans. They inhabit crevices, either in the rock substrate or between barnacle carapaces, and are distributed throughout the littoral. The various species, however, usually display discrete distribution patterns.

Six species from the New Zealand subregion are known to be confined to littoral habitats, all are recorded from rocky shores, and all are members of the family Rhodacaridae (Luxton 1967, 1968; Lee & Hunter 1974). They are: *Hydrogamasus kensleri* Luxton, 1967 (New Zealand, North Island, and Macquarie Island), *Parasitiphis aurora* Lee, 1970 (New Zealand, South Island, Campbell Island, Macquarie Island), *Parasitiphis jeanneli* Andre, 1947 (New Zealand, South Island, Auckland Island, Macquarie Island), *Litogamasus setosus* (Kramer, 1898) (Campbell Island), and *Litogamasus falcipes* Lee & Hunter, 1974 (Campbell Island, Auckland Island). The three species described in this present paper bring the number to nine, in three families.

Family DIGAMASELLIDAE Evans, 1957

Genus *Dendrolaelaps* Halbert, 1915

Pontiolaelaps subgen. nov.

Dorsum with two more-or-less subequal shields in female, anterior dorsal shield considerably longer than posterior dorsal shield in male. No sclerotic nodules between setae z5; setae z3 present; setae j2 situated posterior to z1 and j1; r-marginal setae usually on dorsal shield although r4 may sometimes be on lateral interscutal membrane. Anterior dorsal shield in both sexes depressed anteriorly from a line more-or-less joining setae s1 and j2. Anterior margin of posterior dorsal shield entire, posterior edge considerably toothed; setae R1 on striated lateral membrane; setae S5 and Z5 long and spatulate, S5 longer than Z5. Ventro-anal shield fused posteriorly with posterior dorsal shield in male but free in female; para-anal setae (Jv4) anterior to anal opening; only setae Jv2, Jv3, Jv4 and Zv2 on ventro-anal shield. Metasternal

setae of female situated on sternometasternal shield; endopodal shields of coxae III and IV free on membrane in female and fused to sternal shield only at their anterior extremity in male. One pair of genital setae. Five or six rows of deutosternal denticles, basalmost row the widest otherwise file of equal width throughout. Palp apotele 2-tined. Moveable digit of female chelicera multidentate. Tibia I with 3 ventral, 2 antero-lateral, and 5 dorsal setae; femur II with 11 setae; trochanter III with 5 setae; genu IV with 4 dorsal setae. Leg II of male spurred. Basitarsi II to IV each with 4 setae. Bidactylous; pretarsus, claws and pulvilli of leg I reduced; pair of pulvilli originating between claws with another skirt-like pulvillus originating dorsally at base of pretarsus of legs II, III and IV. Spermatheca of female opening between coxae III and IV.

Remarks. The subgenus described belongs to the family Digamasellidae but cannot confidently be assigned to any accepted genus within it. It is closest to genus *Dendrolaelaps sensu lato* as defined by Lindquist (1975), although it does not possess scleronoduli between setae Z5. In the works of Hirschmann (1974) and Hirschmann & Wisniewski (1982) it keys to subgenus *Multidendrolaelaps* of *Dendrolaelaps*, principally because of the multidentate mobile digit of the chelicera. However, it differs from the forms assigned to this subgenus in the following significant ways: (1) scleronoduli are absent, (2) setae Z5 and S5 are spatulate, (3) the posterior margin of the notogaster is crenate, (4) the integument between the lateral setae is striated.

A number of the characteristics of the New Zealand subgenus may be found in some species of a heterogeneous assemblage known by Hirschmann & Wisniewski (1982) as "fragliche *Dendrolaelaps*-arten". Significantly, the four species in question (*D. watsoni*, *D. schusteri*, *D. kargi*, *D. templei*) are all from the sub-Antarctic region (the first three from Macquarie Island, the fourth from Heard Island). Individually they may resemble the New Zealand subgenus in certain important ways. For example, none possess scleronoduli (although the male of *D. watsoni* is illustrated with them in Hirschmann 1966), *D. watsoni* and *D. schusteri* have a crenate posterior border to the notogaster, and the Z5 setae are spatulate in *D. templei*. On the other hand, they have insufficient characters in common to unite them into a single supraspecific taxon.

The two species described from New Zealand appear to represent a small aberrant offshoot from the main digamasellid stream with certain significant characters unique to them. These differences require recognition, which is why a new subgenus has been erected, but the similarities are also noted in assigning the new subgenus to a somewhat widened concept of the genus *Dendrolaelaps*. It may be necessary, when more material is discovered and described from this region, to elevate the subgenus to full generic status.

***Dendrolaelaps (Pontiolaelaps) crenatus* sp. n.**

(Figs. 1-13)

FEMALE

Dimensions: Average length of anterior dorsal shield (n = 2) 358 μm (345 and 370); average length of posterior dorsal shield 335 μm (320 and 350); average overall length 693 μm ; average width at widest point 375 μm (365 and 390).

Gnathosoma: Tectum 3-pronged, median prong narrow and notched at tip, lateral prongs serrate on outer edges. Palp apotele 2-tined. One female with 6 rows of deutosternal denticles, one other and males with 5; basalmost row of denticles the widest, otherwise file of even width throughout; number of teeth per file from anterior-most: 6,12,10,12,24. Chelicerae multidentate, the moveable digit with 9 backwardly facing teeth, the posteriormost being the largest; fixed digit with 5 or 6 teeth. Corniculi horn-like.

Dorsum: Dorsal shield divided; anterior dorsal shield with 22 pairs of setae, posterior dorsal shield with 19 pairs of setae. Both shields coarsely punctate with some areolar areas smooth or finely punctate; both shields somewhat reticulated at their antero-lateral corners; no refractive sclerotic nodules between setae z5; antero-dorsal shield fused with peritrematal shield anteriorly to level of seta r2. Peritrematal shield extending from level of coxa IV almost to seta z1. Posterior dorsal shield with setae S5 and Z5 much enlarged and spatulate, both on tubercles; setae S5 somewhat larger than Z5 and with a pore anterior to its base. Setae J5 somewhat setose, all other dorsal setae robust, smooth and pointed. Posterior edge of posterior dorsal shield strongly denticulate. Setae R1 on striated lateral membrane.

Venter: Ventro-anal shield irregular in outline; aciculae posterior to anal opening well developed; bearing 9 setae, the para-anals anterior to anal opening. Shield more coarsely punctate posteriorly and reticulated. Two pairs of setae (Zv1 and Jv1) on striated membrane between genital and ventro-anal shields; setae Zv3 and Jv5 on membrane lateral to ventro-anal shield. Two small, finely punctate patches in striated integument laterally to ventro-anal shield, another at posterior corners of genital shield. Laterally in striated integument of venter are 2 further pairs of larger, elongate, finely punctate patches, the anteriormost carrying a conspicuous pore. Genital shield wedge-shaped, bearing 1 pair of setae and punctations, the lateral ones appearing elongate. Four pairs of sternal setae, st1 on punctate membrane, st4 on posterior corners of shield. Sternal shield finely punctate, with some reticulation laterally. One pair of elongate pores on anterior edge of shield and a second pair postero-lateral to seta s2. Endopodal shields of legs III and IV free on membrane. No presternal or metasternal shields. Spermatheca surfaces between coxa III and IV.

Legs: Bidactylous, claws of leg I relatively less robust than those of other legs. Many leg setae spine-like. Leg chaetotaxy (ventral, lateral, dorsal): Tibia I 3-4-5, II 2-3-5, III 2-2-4, IV 2-2-3; Genu I 3-4-5, II 2-3-6, III 2-2-5, IV 1-2-4; Femur I 5-2-6, II 4-2-5, III 1-2-3, IV 2-1-3; Trochanter I 3-1-2, II 3-2-0, III 3-1-1, IV 3-1-1; Coxa I 2-0-0, II 2-0-0, III 2-0-0, IV 1-0-0. Pulvilli comprising a narrow and pointed pair originating between claws and a skirt-like pulvillus arising dorso-proximally from pretarsus.

MALE

Dimensions: Average length of anterior dorsal shield (n = 2) 365 μm (370 and 360); average length of posterior dorsal shield 290 μm ; average overall length 655 μm ; average width at widest point 450 μm (460 and 440).

Gnathosoma: Tectum similar to that of female but with a more strongly arched median curve. Moveable digit of chelicera with a single backward pointing tooth; spermatophoral organ straight and blunt, subequal to moveable digit. Fixed digit of chelicera with 3 teeth.

Dorsum: Anterior dorsal shield with many more areoles than that of female; posterior dorsal shield with 2 more pairs of pores than female. Ridge connecting setae j2; anterior dorsal shield connected to peritrematal shield to level of seta r3.

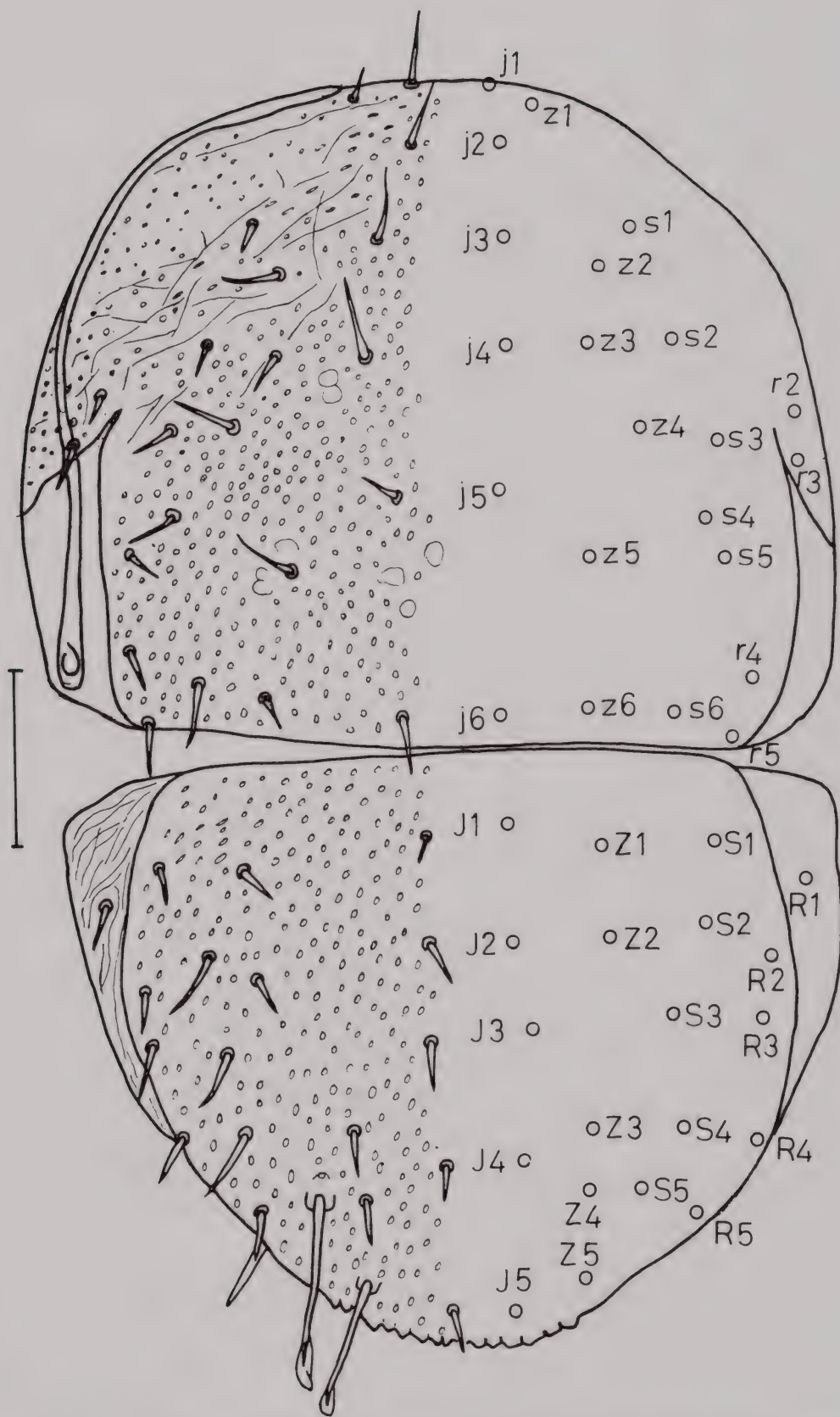


Fig. 1. *Dendrolaelaps (Pontiolaelaps) crenatus*, female. Dorsal view. Scale represents 50 μm .

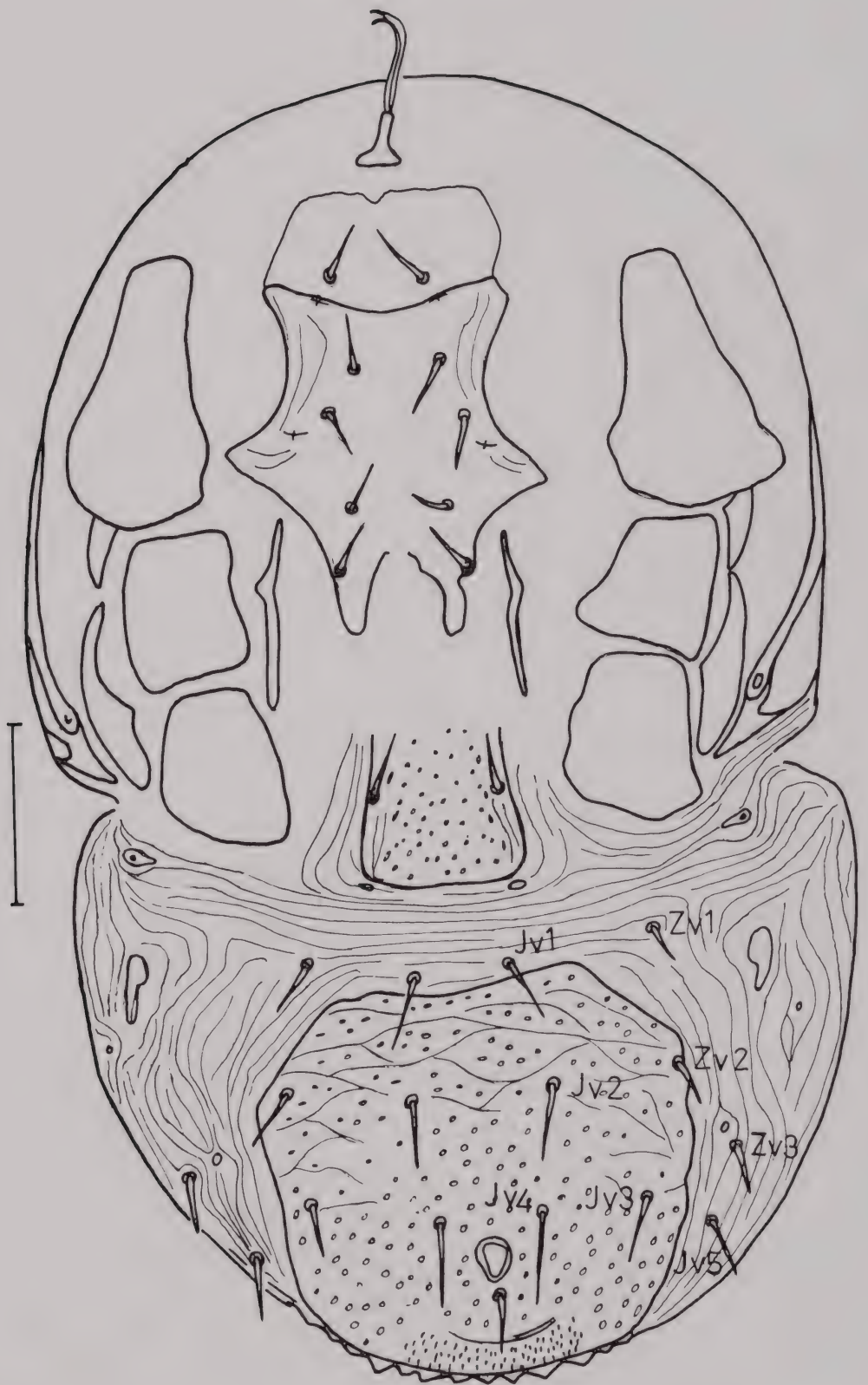


Fig. 2. *Dendrolaelaps (Pontiolaelaps) crenatus*, female. Ventral view. Scale represents 50 μm .

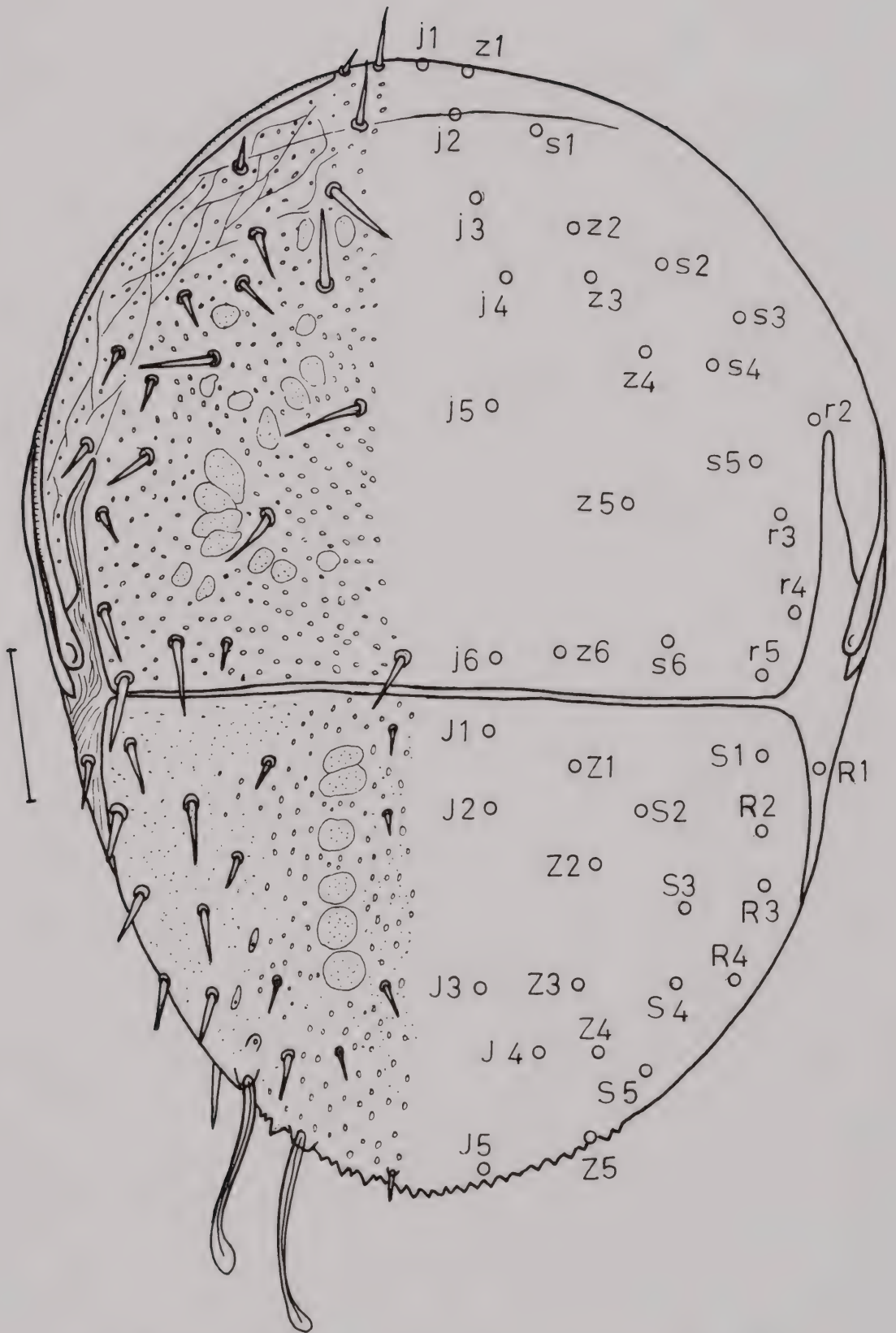
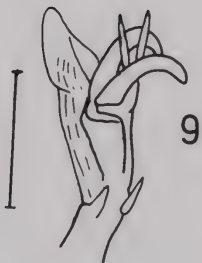
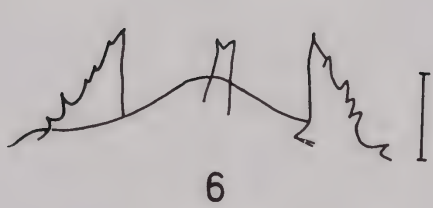
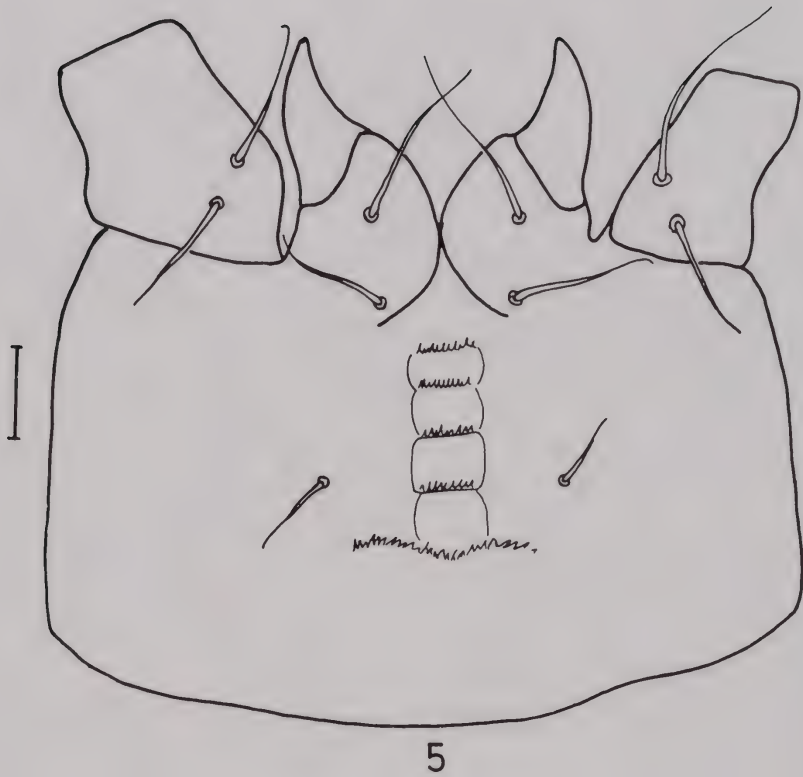


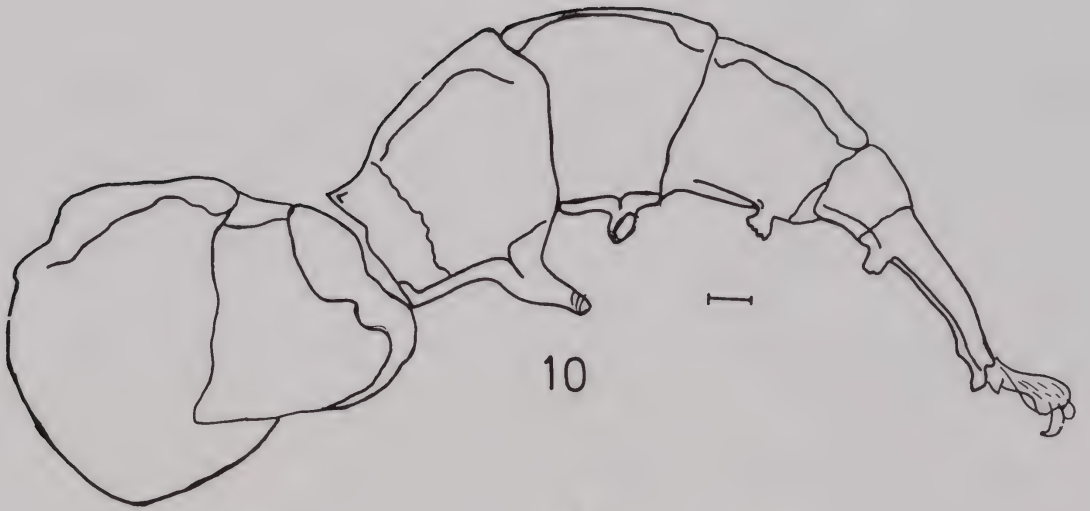
Fig. 3. *Dendrolaelaps (Pontiolaelaps) crenatus*, male. Ventral view. Scale represents 50 μm .



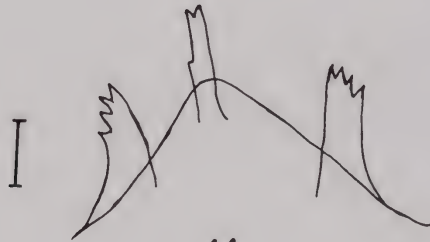
Fig. 4. *Dendrolaelaps (Pontiolaelaps) crenatus*, male. Ventral view. Scale represents 50 μm .



Figs. 5-9. *Dendrolaelaps (Pontiolaelaps) crenatus*. 5. Female. Deutosternum. Scale = 20 μm . 6. Female. Tectum. Scale = 20 μm . 7. Female. Moveable digit of chelicera. Scale = 20 μm . 8. Female. Fixed digit of chelicera. Scale = 20 μm . 9. Claws and pulvillus. Scale = 20 μm .



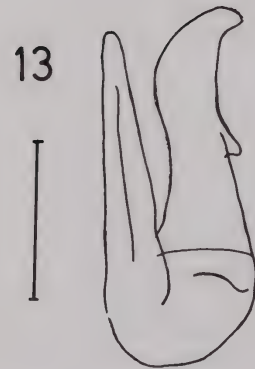
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Figs. 10-13. *Dendrolaelaps (Pontiolaelaps) crenatus*. 10. Male. Leg 11. Scale = 20 μm .
11. Male. Tectum. Scale = 20 μm . 12. Male. Fixed digit of chelicera. Scale = 20 μm .
13. Male. Moveable digit of chelicera with spermatophoral organ. Scale = 20 μm .

Venter: Sternal shield fused to endopodals anteriorly from level of setae st4. Setae st1 in punctate membrane anterior to sternal shield proper; male opening also in this region. Ventro-anal shield extremely irregular, coarsely punctate, bearing 15 or 16 setae (Zv3 present on one side only in both males). Genital setae on separate triangular plates.

TYPE LOCALITY. Intertidal zone, sheltered rock platform, Omaha Cove, Leigh, North Auckland, 5.XII.1968, coll. K. A. J. Wise.

Type specimens. Holotype female and paratype male at the Auckland Museum, Auckland, New Zealand.

***Dendrolaelaps (Pontiolaelaps) terebratus* sp. n.** (Figs. 14-18)

FEMALE

Dimensions: Average length of anterior dorsal shield (n = 3) 288 μm (range 275-310); average length of posterior dorsal shield 293 μm (range 280-310); average overall length 582 μm ; average width at widest point 340 μm (range 330-350).

Gnathosoma: Typical for genus. Five rows of deutosternal denticles, the basalmost the widest and arranged in 2 anteriorly directed curves. Moveable digit of chelicera with 6 backwardly directed teeth.

Dorsum: Typical for genus. Setae of anterior dorsal shield relatively more massive than in *D. (P.) crenatus* while J setae of female are relatively much smaller. Some setae of J and Z series may be somewhat setose (especially J5, J4 and Z4).

Venter: Ventro-anal shield regular in outline and heavily reticulated anteriorly, otherwise venter typical for genus.

Legs: Typical for genus. Pulvilli between claws less well defined than in *D. (P.) crenatus*.

MALE

Not known.

TYPE LOCALITY. Among *Elminius* sp. on rock, exposed rock platform, opposite Goat Island, Leigh, North Auckland, 5.XII.1968, coll. K. A. J. Wise.

Type specimens. Holotype female at the Auckland Museum, Auckland, New Zealand; paratype female at the British Museum (Natural History), London.

Remarks. *Dendrolaelaps (Pontiolaelaps) terebratus* is readily distinguished from *D. (P.) crenatus* by its smaller size, by the massive peg-like setae on the anterior dorsal shield, and by the greater extent of reticulation on the more regular shaped ventro-anal shield.

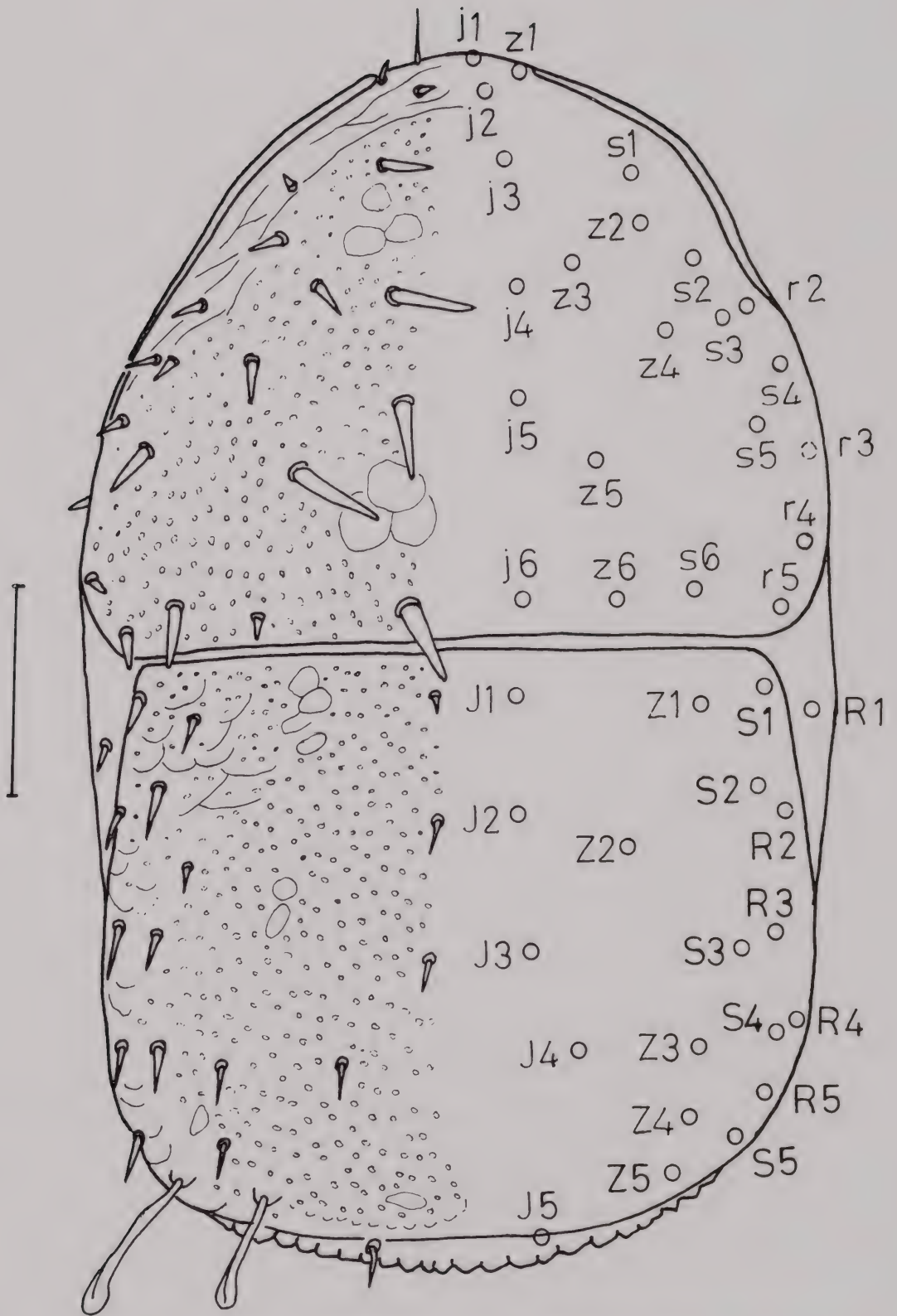


Fig. 14. *Dendrolaelaps (Pontiolaelaps) terebratus*, female. Dorsal view. Scale represents 50 μm .

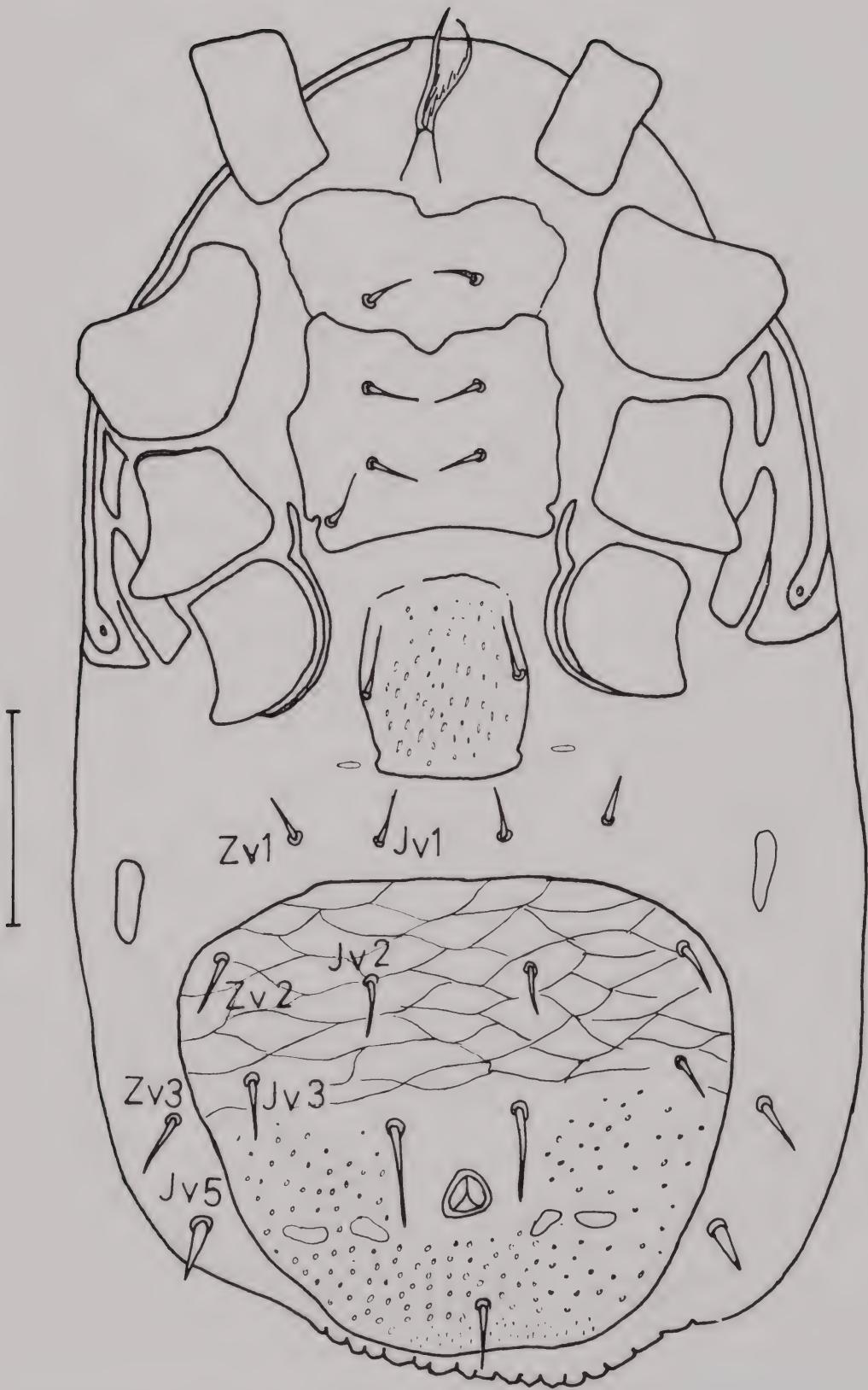
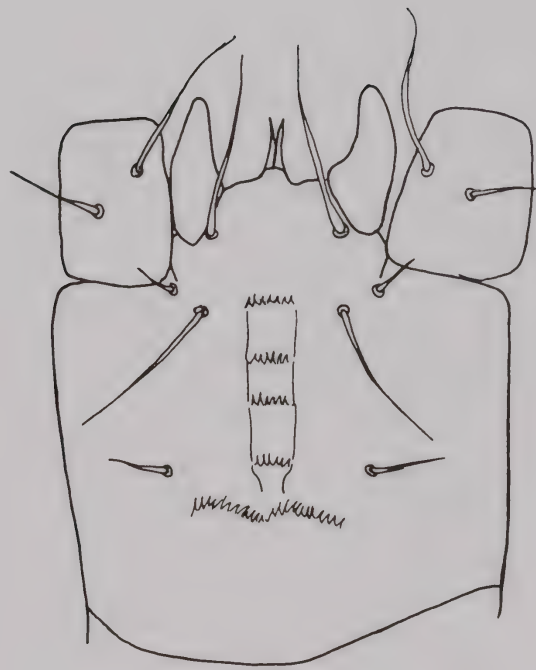


Fig. 15. *Dendrolaelaps (Pontiolaelaps) terebratus*, female. Ventral view. Scale represents 50 μm .



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Figs. 16-18. *Dendrolaelaps (Pontiolaelaps) terebratus*. 16. Female. Deutosternum. Scale = 10 μm . 17. Female. Tectum. Scale = 10 μm . 18. Female, Chelicera. Scale = 10 μm .

Family ASCIDAE Voigts & Oudemans, 1905

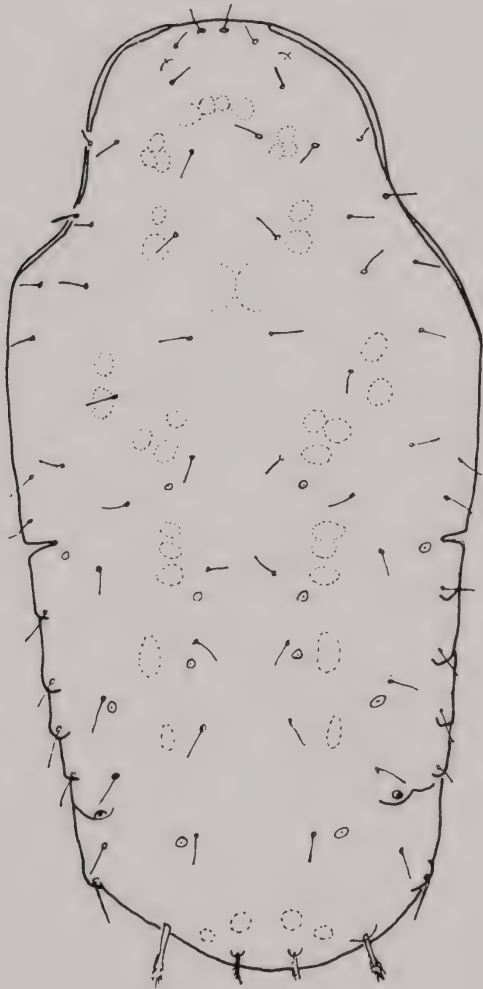
Genus *Leioseius* Berlese, 1916

Leioseius australis sp. n.

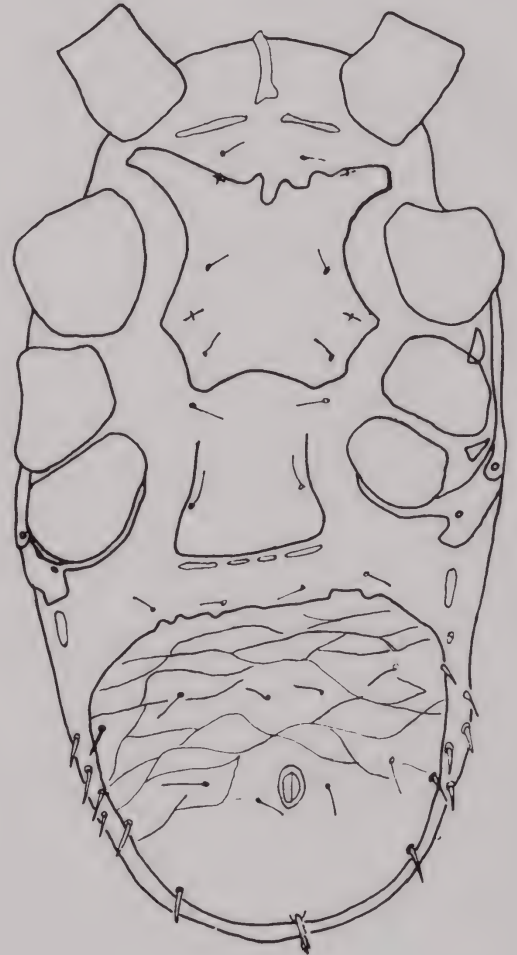
(Figs. 19-27)

FEMALE

Dimensions: Average length (n=2) 393 μm (390 and 395); average width at level of dorsal shield incisions 180 μm .



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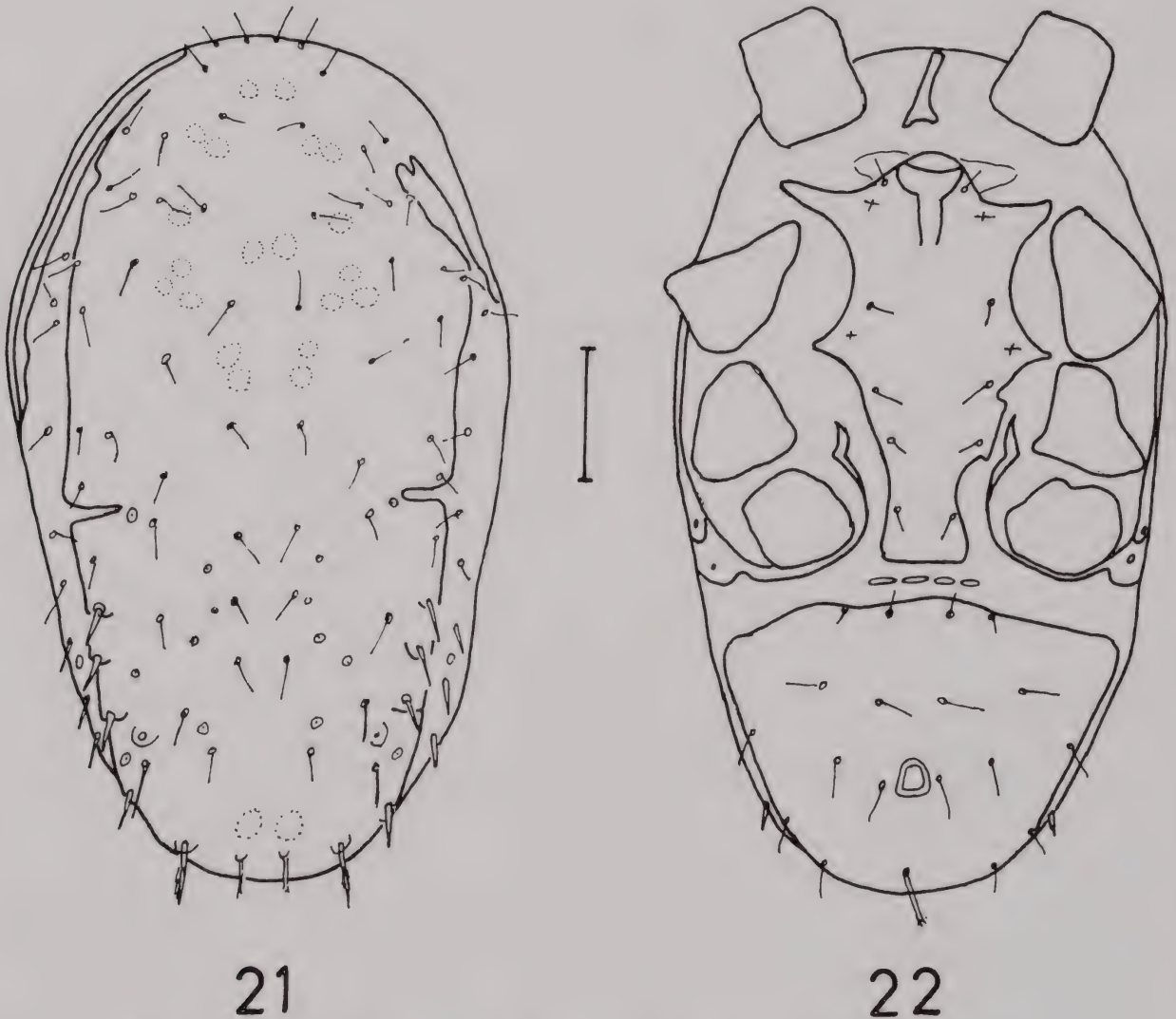


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Figs. 19-20. *Leioseius australis*. 19. Female. Dorsal view. Scale represents 50 μm . 20. Female. Ventral view. Scale represents 50 μm .

Gnathosoma: Tectum 3-pronged with teeth more-or-less well developed. Palp apotele 2-tined. Eight or 9 rows of denticles in a narrow file and weakly developed. Moveable digit of chelicera with 2 teeth. Corniculi horn-like.

Dorsum: Dorsal shield with lateral incisions; anterior dorsal shield with 19 pairs of setae and with 4 pairs on the lateral membrane; posterior dorsal shield with 15 pairs of setae and with 6 pairs on the lateral membrane. Numbers of setae on anterior dorsal shield may vary between specimens since some setae (in particular s2, r5) may be either on shield or on lateral membrane. Both shields finely punctate with some large specialised punctations on posterior dorsal shield distributed as in Fig. 19.



Figs. 21-22. *Leioseius australis*. 21. Male. Dorsal view. Scale represents 50 μm . 22. Male. Ventral view. Scale represents 50 μm .

Anterior dorsal shield without these specialised punctations but with many faintly discernible areoles. Posterior dorsal shield somewhat scabrous on lateral edges with S setae being particularly robust and on elevations of the integument. Anterior dorsal shield fused with peritrematal shield anterior to seta s1. Peritrematal shield extending from coxa IV almost to seta j2. Setae J5 and Z5 somewhat setose. Most dorsal setae smooth, narrow and pointed.

Venter: Ventro-anal shield regular in outline except for anterior edge which is irregular; zone anterior to anal opening reticulated; para-anal setae closer to posterior edge of anal opening, post-anal seta somewhat setose and distant from anal opening; 5 other pairs of setae present on this plate making 15 setae in total. One thorn-like ventro-lateral seta adjacent to edge of ventro-anal plate; two pairs of ventral setae between ventro-anal and genital plates, together with 2 pairs of small, narrow accessory plates. A further elongate punctate area situated in ventral membrane below peritrematal area. Peritrematal plate extending below coxa IV, fused with endopodal plate and bearing a small pore. Genital shield truncate, with one pair of setae. Sternal shields not fused to endopodal shields, anterior edge irregular, and bearing only 2 setae; st1 presternal, st4 poststernal. Tritosternum base narrow and elongate. Spermatheca surfaces on coxa III.

Legs: Bidactylous, claws of leg I relatively less robust than those of other legs. Leg chaetotaxy (ventral, lateral, dorsal): Tibia I 2-4-6, II 2-4-4, III 2-3-3, IV 2-4-4; Genu I 2-4-6, II 2-4-5, III 2-3-4, IV 1-3-5; Femur I 4-3-5, II 3-4-4, III 1-2-3, IV 2-1-3; Trochanter I 3-2-1, II 3-2-0, III 3-1-1, IV 3-1-1; Coxa I 2-0-0, II 2-0-0, III 2-0-0, IV 1-0-0.

MALE

Dimensions: Average length (n = 3) 325 μm ; average width at level of dorsal shield incisions 145 μm (140-150).

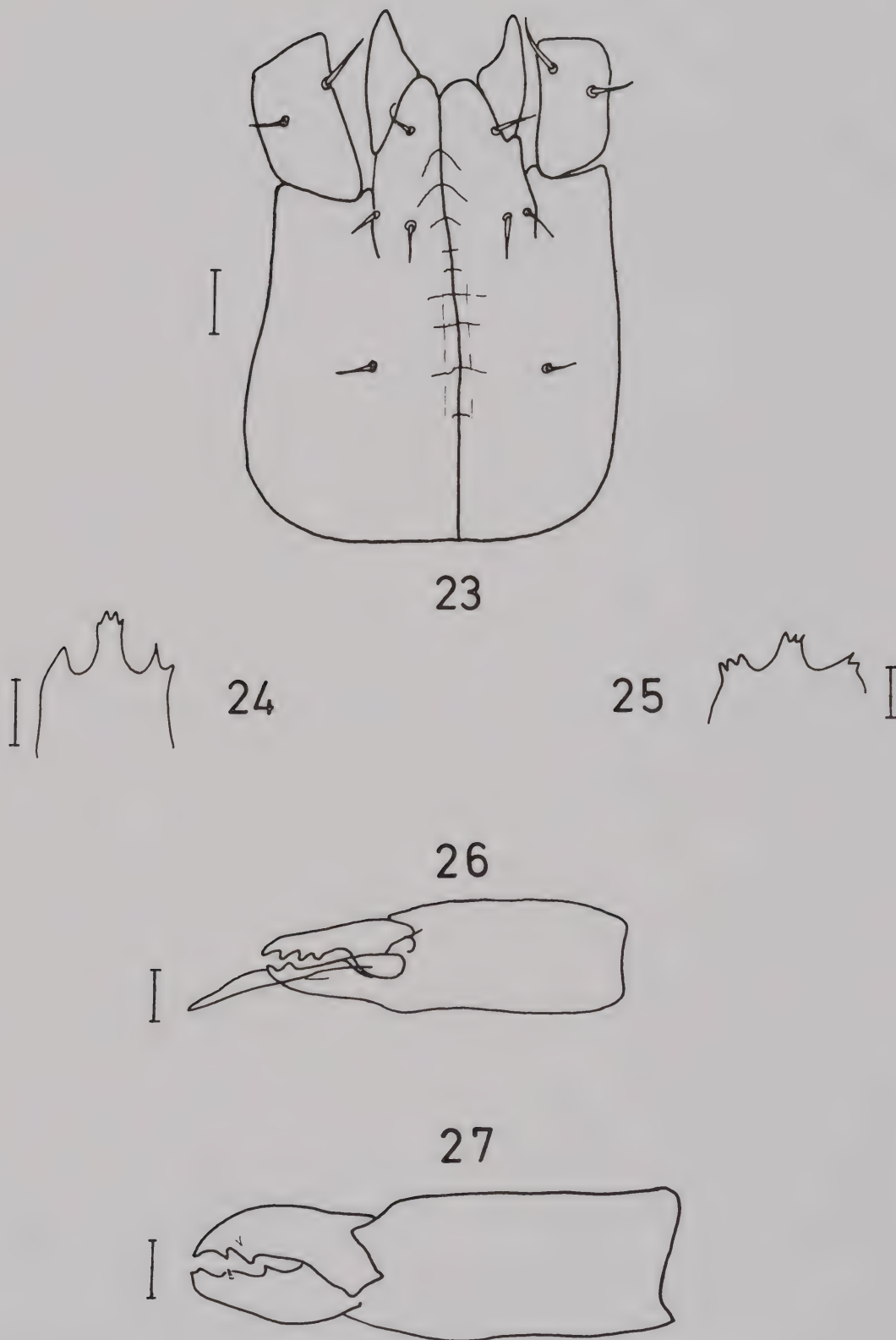
Gnathosoma: Tectum similar to that of female, teeth perhaps more apparent. Moveable digit of chelicera with 3 teeth; spermatophoral organ straight and smooth; fixed digit of chelicera with a single tooth.

Dorsum: Essentially similar to that of female. Anterodorsal shield occasionally with an extra seta (19 or 20 pairs); 4 or 5 setae on lateral membrane. Posterodorsal shield with 15 pairs of setae; five pairs on lateral membrane.

Venter: Ventro-anal shield fused to posterodorsal shield posteriorly and bearing 19 setae. One pair of setae on membrane lateral to ventro-anal shield. Two pairs of plates in membrane between ventro-anal and sterno-genital shield. Sterno-genital shield with 5 pairs of setae, male opening on anterior edge. Endopodal shields of coxae III and IV free on membrane. Peritrematal shield fused with endopodal shield of coxa IV. Spermatheca surfacing at coxa III.

TYPE LOCALITY. From barnacles (*Elminius*) on rock, exposed rock platform opposite Goat Island, Leigh, North Auckland, 5.XII.1968, coll. K. A. J. Wise; from barnacles (*Chamaesipho*) on rock, exposed rock platform, opposite Goat Island, Leigh, North Auckland, 5.XII.1968, coll. K. A. J. Wise.

Type specimens. Holotype female and paratype male at the Auckland Museum, Auckland, New Zealand; paratype female and paratype male at the British Museum (Natural History), London.



Figs. 23-27. *Leioseius australis*. 23. Deutosternum. Scale = 10 μm . 24. Female tectum. Scale = 10 μm . 25. Male tectum. Scale = 10 μm . 26. Male chelicera. Scale = 10 μm . 27. Female chelicera. Scale = 10 μm .

Remarks. The new species accords with Lindquist & Evans' (1965) definition of genus *Leioseius* in all respects except that it possesses 12, rather than 13, setae on genua and tibiae I. It is proposed to widen the definition to accommodate this difference rather than to erect a new supraspecific taxon.

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